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Welcome Remarks and Context for the Workshop

Speaker: Ali Khan (CDC)

The landscape for public health preparedness is changing; it has brought new focus to building capabilities at the local, state, and federal levels. The threat environment also has changed; terrorists are moving away from big bang events (i.e., 9/11) and toward smaller ones (i.e., Times Square bombing attempt, printer cartridge bombs, and underwear bombs). To respond, public health preparedness must be able to rapidly recognize that, although smaller events may result in fewer deaths, they can still have a major impact. In addition, the threat of climate disruption has led to a substantial number of natural disasters (i.e., hurricanes, tornadoes).

In the midst of these issues, the fiscal landscape also has changed, making maintenance of core activities for disaster response challenging. Since the founding of the original bioterrorism program in 1999, the program has changed dramatically, with much of the funds now being redirected to local and state partners. The initial infusion of funds enabled considerable progress, but many major gaps remain, such as community preparedness at some state and local levels; responses to the special needs of vulnerable and at-risk populations; need to address behavioral health issues; and integration of state and local health departments, the medical community, and other partners in public health.

Key components of CDC's preparedness plan are surveillance and epidemiology. High quality data are needed for decision making. CDC can fulfill these needs by gathering information and disseminating it. Good science is needed to provide information that will allow decision makers to take action. Without quality, timely detection and response system, such medical countermeasures as strategic national stockpiles will not be well used.

Disaster epidemiology is a distinct science that needs to be supported. Tasks specific to each stage of a disaster involve collecting and disseminating data in a timely manner. At the federal level, a workgroup is focusing on ways to promote and improve our ability to provide good science during disasters by identifying funding pathways, simplifying the data collection process, and ensuring timeliness of data reporting. The workgroup also is determining what studies are needed and how these studies can be more easily be conducted, such as by having a standing national institutional review board (IRB). Disaster epidemiology requires its own resources, not just funding support.

Facilitated Discussion: Biosurveillance

States were curious to hear why the Office of Public Health Preparedness and Response cooperative agreements focus so much on biosurveillance, especially on anthrax. Dr. Khan described how the language of biosurveillance was quickly adopted in 2005 by the White House, who has continued to associate this term with many activities. Anthrax has remained the ideal biologic agent for preparedness, so focus on this agent will continue. Response was envisioned as a system that would receive all the data and send out alerts accordingly. This system has not been practical, and work has been done to understand how to identify information key to decision making. The language used to describe disaster epidemiology is also important because the term, biosurveillance can be confusing. "Bio-" refers to people, and the focus of surveillance should be on community integration, such as behavioral factors.

Facilitated Discussion: Value of Disaster Epidemiology

Participants asked what CSTE can do to make disaster epidemiology an integrated discipline. Dr. Khan discussed looking critically at capabilities, deciding whether they address current needs, and altering them if necessary. Next steps would be helping states develop plans to achieve these capabilities, identifying resource elements and best practices, and promoting the value of disaster epidemiology as an independent specialization that helps to ask and answer questions during disasters.

Facilitated Discussion: Radiation Response

The status of radiation preparedness in the United States is not optimal. As highlighted by the Fukushima incident in Japan, the number of health physicists in the United States is insufficient, and laboratories do not have the capabilities to test for specific agents. CDC nearly exhausted resources responding to an event on foreign soil. A major need is information integration and communication. Information from the state and local levels was not combined with federal information. Attempts were made to involve the states through interagency weekly phone calls, but the information flow concerning radiation screening at airports broke down. CDC took 3–4 weeks to provide states with formal policy action guidance and threshold recommendations. Data are often circulated more quickly at the federal level, but pushing this information down to the states needs improvement. In addition, communication within states is sometimes lacking, especially if additional security precautions surround the information. One resolution to the communication breakdown was to identify a public health spokesperson to represent the U.S. Department of Health and Human Services in the future. During the Fukushima incident, the U.S. Secretary of Defense was the spokesperson to the media, but there was not a corresponding public health person.

Overview

Speakers: Amy Wolkin (CDC) and Janet Hamilton (Florida DOH)

The first National Disaster Epidemiology Workshop in May 2010 provided the first opportunity for a focused discussion of disaster response by epidemiologists. The four disaster epidemiology subcommittee workgroups—Rapid Needs Assessment (Community Assessment for Public Health Emergency Response [CASPER]), Health Surveillance, Tracking/Registries, and Epidemiologic Research—conducted breakout sessions at the 2009 meeting, where the goals were to discuss strengthening disaster epidemiology capacity, integrating this discipline into the overall response effort, and identifying capabilities common to disaster epidemiologists. Discussions highlighted the need for disaster epidemiology activities to provide timely situational awareness and actionable information during all three phases of a disaster (pre, during, and post) and for integration into the overall management cycle. A forthcoming report will provide recommendations for four major players in disaster response: CSTE, CDC, state and local health departments, and academic communities. Over the last year, the Disaster Epidemiology Subcommittee presented at the annual CSTE conference and participated in the Public Health Preparedness Summit earlier in 2011. The 2011 National Disaster Epidemiology Workshop will build on previous activities and serve as a venue for discussions in addition to sharing didactic presentations.

Session #1—Surveillance

Surveillance and Disaster Epidemiology Data

Moderator: Betsy Kagey, PhD (GA DPH)

Presentation 1. The Emergency Responder Health Monitoring and Surveillance System and its Implementation in the Deepwater Horizon Event

Speakers: Renee Funk, DVM, MPH, and John Halpin, MD, MPH (NIOSH)

Renee Funk gave a presentation on the Emergency Responder Health Monitoring and Surveillance (ERHMS) workgroup, which has been active since 2008. The workgroup's end product was

the the National Response Team Technical Assistance Document (which was in draft at time of presentation). ERHMS covers all disaster phases and addresses short- and long-term health effects. The drafted technical assistance document was designed as an interagency document that is scalable, provides guiding principles and minimum information, and identifies existing tools.

The presentation outlined the use of the draft document in each phase of the response to the Deepwater Horizon (DH) event. During predeployment, it was used to guide rostering and credentialing, as well as health screening and training. During deployment, it was used to guide on-site rostering, on-site training, document personal protection equipment, conduct exposure assessments, and monitor illnesses and injuries. During the Deepwater Horizon event, 60 NIOSH staff were in the field rostering >55,000 workers using paper forms; this had never been done on such a large scale. During post-deployment, the document was used to guide outprocessing assessments, analyze exposure data in conjunction with health data, and determine the need for long-term monitoring.

John Halpin summarized results from injury and illness surveillance/assessments conducted during the Deepwater Horizon event. Surveillance was based on safety incident forms, and data were provided by Unified Command and BP. NIOSH analyzed data, including the reported total number of injuries and illnesses compared with the number of workers each week graph (rates) and the reported time trend of cases of heat-related illness vs. heat index graph (see slide). NIOSH also conducted Health Hazard Evaluations (HHEs) onshore and offshore and developed a strategy for prioritizing HHEs and identifying groups of greatest concern. For the Deepwater Horizon event, NIOSH was most concerned about workers' exposure to the source control (the actual well). Heat-related illness was one of the biggest issues during the Deepwater Horizon event. After deployment, the transition of authority during the post-deployment phase also was of concern.

The next steps for this workgroup are to conduct outprocessing assessments, including exit surveys, to track the workers of greatest concern and to partner with ERHMS to review draft guidance and tools: www.cdc.gov/niosh/docket/review/docket223.

Highlights from NIOSH Q and A

How was Incident Command System (ICS) handling the health issues? The ICS was on top of short-term health effects, but long-term health issues were not addressed.

How did the rostering and badging systems work? Did badges have a bar code? The bar code system was implemented late and as a result, not used; many people rostered were not badged, and badged people not always rostered.

What percentage of the workers actually got rostered? Not sure; highest number of workers on any given week was about 40,000.

How did you enter and manage the data collected on 55,000+ people? NIOSH entered 18,000, then contracted the rest.

Were there issues with the entries on the forms being handwritten? A lot of them were difficult to read; scannable forms were not working well either.

Presentation 2. Disaster Epidemiology Baseline Data Assessment

Speaker: Amy Wolkin, MSPH (CDC)

One of the groups to come out of the 2010 National Disaster Epidemiology Workshop is the baseline data assessment workgroup. This group's goal was to assess the use of baseline data during disaster response by distributing a survey to states in the upcoming months to collect information on what types of data sources are used for baseline data. Amy Wolkin presented the assessment and solicited feedback from the attendees.

The goal of the survey is to identify sources, benefits, and uses of baseline data. The survey will collect information about the following: whether a state-level department exists that is responsible for disaster surveillance; types of disasters for which surveillance has been conducted; type of surveillance conducted in those situations (e.g., syndromic, drop-in); use of baseline data to compare collected

surveillance data; sites included in surveillance (e.g., shelters, hospitals); persons or organizations with whom data are shared and mechanisms by which they are shared; evaluations of the effectiveness of surveillance; lessons learned; and other disaster epidemiology activities conducted by represented jurisdictions (e.g., Registry, CASPER).

In the facilitated discussion on baseline data that followed the summary, addition of the following to the survey was suggested: What is currently in states' plans? Include any emergency response, not just disaster. Differentiate between syndromic and laboratory surveillance. Which part of health department is involved? Do you have disaster-related case definitions? Are you willing to share definitions? Do you use advanced technologies (e.g., scannables, handhelds)? Are you willing to share tools and databases? Was the information collected validated and useful? Other than health events, do you use other measurements to determine risks?

Other points discussed were ways to get ICS to use the data we collect and suggestions to send the survey to local jurisdictions because most disasters are local and the state might not work on the response (suggest to work through the National Association of County and City Health Officials or have the State Epidemiologist send to locals).

Evaluation of Disaster Epidemiology Surveillance Activities

Moderator: Josephine Malilay (CDC)

Presentation 1. Residential Carbon Monoxide Alarm Ordinance Awareness and Prevalence

Speakers: Shahed Iqbal (CDC) and Bobby Cobb (Mecklenburg County Health Department)

Disaster eEpidemiology efforts led to enactment of residential carbon monoxide (CO) alarm ordinances. CO poisoning, known as the "silent killer," causes nonspecific symptoms that often lead to misdiagnosis. The number of cases is typically underestimated. Vulnerable populations include the elderly and males because they are more likely to live alone. Incidence rises during the winter, when home heating systems are in constant use, but incidence also spikes during natural disasters because of the misuse of generators. Because generators do not work well in cold weather, people bring them indoors, which builds up CO inside the home. Most cases occur in residential settings and are preventable.

In Mecklenburg County, North Carolina, work on the CO alarm ordinance began in 1999 when a car left running in a garage left three people dead and three others sick in adjoining condos. A diverse coalition including the gas company, inspectors, responders, hospitals, and the real estate community prepared an ordinance by September 2000. At first, the board of commissioners intended not to adopt the ordinance, but because of the impressive show of support from different stakeholders (the medical community, private citizens, a city organizing project, the real estate community, and the fire department), the board was persuaded to adopt it. In December 2002, a winter ice storm highlighted the need to modify the ordinance to require a battery backup on the alarms and expand the language to include "any home." A March 2009 survey with 214 completed interviews revealed that homes with attached garages were twice as likely than the national average to have a CO alarm; people aware of the ordinance were nine times more likely than the national average to have the alarm, and some gaps in knowledge existed where people did not know the difference between a CO alarm and a smoke alarm.

Presentation 2. Evaluation of Active Mortality Surveillance following Hurricane Ike

Speaker: Ekta Choudhary (CDC, EIS)

Texas' Disaster Related Mortality Surveillance (DRMS), initiated in 2008, was used during Hurricane Ike. Active surveillance for Hurricane Ike was conducted during September 8–October 13, 2008. Cause-of-death data were obtained from mortality forms filled out by Medical Examiners (ME) and Justices of Peace (JP). The case definition for a Hurricane Ike–related death fell into three categories: 1) *direct*—drowning from flooding; 2) *indirect*—death caused by a situation resulting from

hurricane and CO poisoning; and 3) *possible*—death undetermined or for which information indicates a relationship to hurricane and includes chronic underlying illnesses that might have been aggravated. The mortality forms were adapted from CDC’s DRMS form. This study is the first application of the DRMS system. Upon activation, guidelines, case definitions, and surveillance forms were sent to ME and JP in affected counties. In addition to the mortality forms, news alerts were used to identify any deaths that might have been missed.

The DRMS system was compared with the use of vital statistics to evaluate surveillance effectiveness. The DRMS system provided mostly complete information with a 1-day turnaround, whereas the vital statistics process required a 10-day turnaround with limited demographic information. However, the study did find that applying “indirect” and “possible” case definitions was difficult for ME and JP. Performance measures were used to evaluate the DRMS system, including usefulness, simplicity, flexibility, data quality, representativeness, timeliness, stability, strengths, and recommendations. Some meeting participants noted concerns about the inconsistent use of cause-of-death definitions between states, especially for secondary and tertiary causes; how to identify a gold standard to use for comparison; and sensitivity in situations where people moved out of the area after the hurricane and died outside the county, where the surveillance system might not extend. Dr. Choudhary noted that the study tried to address movement out of the county by including 10 surrounding counties in addition to the 34 affected counties.

Community Assessment for Public Health Emergency Response (CASPER)

Moderator: Sara Vagi, PhD (CDC)

Presentation 1. Brief Overview of CASPER

Speaker: Amy Wolkin, MSPH (CDC)

Amy Wolkin gave a brief overview of CASPER, an epidemiologic technique that provides household information quickly and at low cost. CASPER uses a multistage probability sampling method (30 × 7 design), and reports can be generated within 48 hours. CASPER can be used during and after a disaster, for nondisaster surveys, and to provide good science and actual numbers for decision making. CDC has developed a CASPER toolkit that covers data collection, methodology, report writing, and training. The toolkit is available online (2nd edition coming out soon). By request, CDC trains up to three states per year and provides technical and field assistance.

Presentation 2. Mental Health Needs Assessment after the Gulf Coast Oil Spill, Alabama and Mississippi, 2010

Speaker: Danielle Buttke, DVM, PhD, MPH (CDC)

During the Deepwater Horizon event, mental health needs became evident. Alabama and Mississippi requested CDC assistance to conduct a CASPER survey to assess mental health needs. CASPERs were conducted in Alabama in August 2010 and in Mississippi in October 2010. The objectives of the CASPER were to provide information to states for allocation of resources and to explore using CASPER as a tool to evaluate mental health needs. A third stage of sampling was added to account for individual household selection. State-based Behavioral Risk Factor Surveillance System (BRFSS) data were used for comparison.

The CASPER completed 156 interviews within 1.5 days. Compared with BRFSS data, CASPER data indicated that Mississippi and Alabama had worse mental health status after the Gulf Coast oil spill, higher prevalence of worrying about paying rent/mortgage, and changes in normal activities since the Deepwater Horizon event (i.e., decreased time outdoors, decrease local seafood consumption), which can affect mental health. States have obtained grant money from BP to be used for mental health services.

Limitations to CASPER include inability for a direct comparison with BRFSS data because BRFSS was state based, whereas CASPER was conducted only in coastal counties; major population changes since the 2000 Census; and an inability to establish causal relationships. In conclusion, CASPER was effective in assessing mental health needs.

Presentation 3. Evaluating CASPER in NC, 2003–2010

Speakers: Aaron Fleischauer, PhD (NC CEFO) and Jennifer Horney, PhD (UNC)

In North Carolina, a quantitative study was conducted with 210 responses to determine reasons/barriers for using CASPER in public health practice or disaster setting. The survey addressed the following questions: How many people used CASPER and how often? What is the likelihood of using CASPER in the future? What are the key items that facilitate use of CASPER? What are the potential barriers? What is the organization capacity (e.g., equipment, fiscal resources, training, personnel)?

Of the 46 uses of CASPER reported by 52 local health departments, 67% were likely to use in CASPERs the future, including conducting health impact assessments and post-disaster assessments. It was evident that CASPERs are most beneficial when the objectives and goals are clear. Although local health departments intend to use this tool in the future, additional support is needed from state or other partners. CASPERs are relatively quick and inexpensive to conduct, yet still cost a lot of money, and most states will not continue to support advanced technology for CASPER. Other barriers included lack of equipment, lack of trained staff, and lack of planning time.

North Carolina is prioritizing a methodology for routine public health practice. For more information, visit the disaster epidemiology website under NC health department (Google “CASPER North Carolina”).

Presentation 4. CASPER: The Kentucky Experience and Future Directions

Speaker: Doug Thoroughman, PhD, MS (CEFO, Kentucky Department of Public Health)

Doug Thoroughman summarized Kentucky’s limited but growing experience with CASPER, progressing from emergency use only to standard practice. The first CASPER Experience was the 2009 Kentucky ice storm. The state used CASPER to assess needs in parts of Kentucky without power by conducting four surveys in the most affected areas (735 interviews conducted). CDC assisted with mapping, sampling, and field work. The second CASPER experience was the 2010 Health Impact Assessment of the Green River District region in regard to concerns about high concentration of coal-fired power plants. The industry had proposed three new coal gasification facilities and wanted to gauge public opinion. The survey asked about public health perceptions. CDC provided a smaller CDC team, and Kentucky used handhelds and did all the fieldwork. The third CASPER experience are the 2011 National Level Exercises in western Kentucky at the New Madrid Fault (May 16–19, 2011), during which Kentucky will use Applied Public Health Teams to conduct sample selection and two surveys using handhelds and in eastern Kentucky (June 6–10, 2011), where North Carolina will conduct sampling for two full surveys (Emergency Management Assistance Compact tool to use outside disaster setting). Epidemic Intelligence Service (EIS) officers will coordinate the operation and will compare results from eastern and western Kentucky.

Session #2—Methodology

Moderator: Michael Heumann, MA (Oregon DOPH)

Presentation 1. Risks of Death and Injury Associated with the May 3, 1999, Tornadoes, Oklahoma

Speaker: Sheryll Brown (OK)

This study is a large-scale investigation of the Great Plains tornado outbreak that occurred on May 3–4, 1999, in Oklahoma. Fifty-eight tornadoes passed through densely populated areas destroying 3,000 homes and costing more than \$1–1.2 billion. Over the years, the number of tornadoes appears to

be increasing but with a decreasing number of associated deaths because of improved tracking of tornadoes. The Oklahoma City metropolitan area is especially prone to tornadoes, which peak in April and May. The strength of tornadoes is rated on the EF scale (formerly Fujita scale), which uses 28 damage indicators to estimate wind speed from a range of F0 to F5. Risk factors for tornado-related deaths include magnitude of tornado, type of dwelling, individual age and warning timeframe. F4 and F5 tornadoes account for more than 50% of deaths.

During an Injury assessment, medical records were reviewed for tornado-related deaths. A survey was distributed to survivors and decedents' contacts to fill in missing information about the cause of death. One challenge was finding appropriate addresses to which to mail surveys because many homes were destroyed by the tornadoes. A community field survey, similar to CASPER, was conducted as face-to-face interviews with people in damaged areas. The timing of the survey coincided with the day people returned to their homes awaiting insurers. Survey teams walked around the area to interview people and offered to provide them important health documents (e.g., birth certificates). A case-control study design defined cases as deaths identified during the injury assessment in F5-damaged areas, and community field survey respondents served as controls. The oldest age groups experienced the most tornado-related deaths. The most common manner of death was asphyxia. Dwelling type analyses, using odds ratios based on location of individual, revealed that a mobile home was the deadliest place to be during a tornado. When comparing rate of death by safe haven location (which includes away from exterior walls and windows, in a closet, on the first level of dwelling, indoors), locations traditionally considered safe havens may not be as protective as previously believed. Recommendations from this study include further investigations into being in a motor vehicle, which is traditionally considered high risk but found to be associated with low risk in this study; advising people to protect their bodies with blankets or clothing to prevent soft tissue injuries and foreign objects; wearing bike or motorcycle helmets to protect for brain injuries, and increasing the availability and knowledge of the location of tornado shelters. One major lesson learned was that collecting data from multiple sources is vital to obtaining complete data in a disaster setting.

Presentation 2. Wrap-up discussion

Speakers: Doug Thoroughman, PhD MS (CEFO, Kentucky DOPH) and Aaron Fleischauer (NC)

An important task is to getting people to see the value of disaster epidemiology, and that will depend on the capabilities of this field. Because disasters occur at the local level, much of the learning has occurred at the local level, but this knowledge needs to be translated to the federal level. Communication bridges between CDC and the state health departments are important for transferring knowledge in both directions, and Career Epidemiology Field Officer (CEFO) personnel represent one of those bridges. To highlight disaster epidemiology as a discipline with specific associated competencies, a separate certification might be needed. Some states also might have a greater need for disaster epidemiology than others depending on how often disasters occur in those states. Most current health department personnel can incorporate disaster epidemiology into the day-to-day activities of other disciplines, such as communicable disease. For example, one of these activities could involve personnel logging onto system that would be used during a disaster so they become familiar with the system environment. This incorporation into day-to-day activities would build surge capacity rather than creating a full-time equivalent, which is not financially feasible. Encouraging cross-training of personnel can be difficult but is an important aspect of disaster epidemiology. Formation of multidisciplinary strike teams or standing teams for disaster response can illustrate that everyone has a role in disaster response. The purpose is not to carve out a new field but to provide a forum for epidemiologists to develop methods in disaster response. Public health also needs to integrate more thoroughly with emergency preparedness.

Increasing knowledge of the tools available for disaster epidemiology is crucial. The use of CDC programs and resources can help support this process. Other partners, such as the Occupational Safety and Health Administration and volunteer corps (e.g., Medical Reserve Corps, American Red Cross) are

valuable resources. Collecting baseline data for emergency responders can be challenging, but pre-deployment questionnaires and agencies' established databases can provide this information. The recovery phase for communities can last four years, so the need for disaster epidemiology activities may continue well after a disaster.

Session #3—Lessons Learned in Disaster Epidemiology

Lessons Learned Panel Discussion

Moderators: Martha Stanbury (MI) and Ashley Conley (Nashua, NH)

Panelists: David Zane (TX), Sheryll Brown (OK), Renee Funk (NIOSH), John Halpin (NIOSH), Shahed Iqbal (CDC)

The Lessons Learned group began meeting in December with a goal to share lessons learned, best practices, and toolkits with everyone, not just those siloed into this area. Here are a few key points made by the panelists on the basis of their experiences: You don't always have control of the data you're collecting or the way it was procured. Not having electronic and handheld options is a problem for field data collection. Developing templates before a disaster is crucial. Standardization—defining exposure and variables to a measurable extent so they can be evaluated—is needed. Working with regional and local partners is essential for epidemiology and for using data for situational awareness. We need more injury and behavioral health disaster epidemiologists. We need to move toward electronic data sources.

Facilitated Discussion Questions

Were preexisting tools and plans useful or did you find yourself developing them on the fly? Most panelists noted that, although preexisting forms were available, they usually had to be modified for a specific event. Planning ahead for an event was critical, even if the forms turned out to not be quite right. Given the complexity of some responses, communication is essential for ensuring consistent data collection. Using scannable forms would be great, but forms should be able to be tailored to the specific event. In addition, obtaining the data collection form at the beginning of the event would be ideal because changing it later would cause problems. CDC and some states noted they have developed data collection forms for disasters

How has ICS worked in real life? Most panelists agreed that ICS was useful but didn't always work perfectly. Reasons included uncertainty about who was in charge because agency supervisory staff not a part of the ICS chain often need to review and approve agency documents; high rates of staff turnover and not enough ICS training, leaving surge staff without good understanding of ICS; and the need to assign people in ICS structure to roles related to their usual roles. In general, ICS has worked well for situations like pandemic influenza A (H1N1) 2009, for which public health was the lead agency and Incident Commander.

Is there value to easily accessible tools, forms? Are there existing platforms for accessing tools? What is the best way to access for all of us? Most agreed that having a Web portal where tools, forms, lessons learned, and actions taken can be accessed but were not clear where that should be housed and who would maintain it. The Web portal would need to include references to training in the use of these tools as well. Tools should be made available in editable form, not just a PDF. In addition, including baseline data would be helpful so the data collected with the tool have something with which to compare. Existing platforms suggested included CDC Web portal (but noted problems with clearance at CDC; CSTE website, but CSTE has never done anything like this before, so developing it would require thought, work, and funding; and Epi-X. It was noted that the National Alliance for Radiation Readiness will have a repository of lessons learned and toolkits related to disasters.

Action Item

Put together a workgroup of CSTE staff and members to develop a plan/system for posting materials on a website.

Disaster Epidemiology Response to the Nuclear Threat in the US Following the Japan Emergency (short presentation and full group discussion)

Speakers: Martha Stanbury (MI), Michael Heumann (OR), and Art Chang (CDC)

Michael Heumann summarized impact and response in Oregon. Response included dealing with calls from the media and concerned citizens asking for recommendations. Health department staff had to address detection, interpretation, and response to potential/actual radiation detects in air, water, and food; and use of potassium iodide. Oregon responded by coordinating its response activities and Information released with the entire West Coast and federal agencies to ensure a unified message. Oregon had problems obtaining information and cleared data from federal agencies and consistent interpretation of radiologic data.

Art Chang explained that CDC had developed plans for screening travelers. Because Customs and Border Protection staff already were screening all travelers because of antiterrorism initiative, CDC partnered with them, the National Alliance for Radiation Readiness, Association of State and Territorial Health Officials, National Association of County and City Health Officials, and poison control centers. An algorithm with tools and protocols was created to explain decontamination protocols, and this draft form was shared with some partners (who shared it with others), but clearance problems resulted in confusion. The process, however, has ensured that we will now be well prepared for the next event.

Several workshop participants noted the problems caused by this delay and confusing communication. Many issues with restricted communication of information cited “national security.”

Disaster Epidemiology Integration among Local/State/Federal/Academic Partners (panel discussion)

Moderator: Michael Heumann (OR)

Panelists: Wendy Smith (GA), Randolph Daley (EIS, CDC), Eden Wells (University of Michigan)

Each panelist described his or her perspective on disaster epidemiology and how he or she related to colleagues from other jurisdictions or disciplines.

State

Many states, including Georgia, have grappled with creating epidemiologic capacity to respond to a natural disaster, such as a hurricane. CDC’s CASPER guidance provided a clear, systematic method on conducting surveillance in an affected community. In 2010, staff from the CDC’s Health Studies Branch initiated on-site CASPER training to state and local jurisdictions interested in creating in-house disaster epidemiology capabilities. The Health Studies Branch also provides technical assistance in the sampling strategy for a community assessment and data analysis. These assurances, in combination with the CASPER toolkit, prompted Georgia to proceed with planning to create this capacity in the state. There was considerable discussion by participants that this capability, although desirable, is likely to be supported by individuals who have multiple roles in the health department and that having full-time, staff dedicated to disaster epidemiology is not realistic or necessary. In most health departments, disaster epidemiology methods are one set of skills that should be maintained along with a myriad of others.

CDC

Disaster epidemiology capabilities are just one aspect of how CDC integrates with state and local health departments. CDC also provides funding to facilitate work and resource sharing at the state and local levels. One of the most valuable assets that CDC offers is the embedded CDC staff CEFO. CDC provides CEFOs through its Cooperative Agreement with the states, and the CEFOs work daily with state or local health departments to increase overall preparedness. During response to an emergency, CEFOs

provide disaster epidemiology support to the organization in which they are embedded. To increase epidemiologic capacity during a disaster, perhaps states should consider CDC's embedded chronic epidemiology staff, as well as EIS officers assigned to those health departments. Training is another avenue to integrate CDC with state and local health departments. States might request technical assistance calling for subject-matter expertise, supplies, and equipment. CDC has the Strategic Pharmaceutical Stockpile and federal medical stations, as well as other assets. During a multistate event, CDC might lead coordination of deployment of CDC personnel in states to assist with the response: the mechanism of EpiAids, EIS officer detail requests, and public health service emergency response teams; many other CDC staff are on these clinical services response teams and on applied public health teams. CDC has a wide array of expertise and services, including deployable mental and behavioral health teams that can provide situation-specific training for deployed CDC staff and staff at state and local health departments. CDC also has conducted CASPERs in partnership with academic centers and their associated student emergency response teams.

Academia

In discussing how academic institutions can bolster the capacity of state and local public health departments to respond to public health emergencies, the importance of including stakeholders from these institutions was emphasized. If possible, embedding or routinely using student volunteer teams in routine public health surveillance activities is ideal for building reliable surge capacity. Because academic institutions are the trainers of the future public health workforce, it is incumbent upon them to continue connecting with state and local health departments. As the field of disaster epidemiology evolves, training/education should include disaster epidemiology methods. Academic institutions can support state and local health departments during a response by filling gaps at the tribal, state, and federal levels. Academia routinely recruits sites for internships, capstones, and summer internships. Many infection control groups ask for interns to work on projects in the private sector. In addition, preventive medicine residencies play an important role (there are 76 preventative medicine residencies within the United States). Requirements are evolving rapidly with the political climate, and medical residents are required (similar to EIS) by the accreditation board to conduct surveillance activities

Participants were interested in how states use students for disaster response and how they address liability and logistic issues. Because a disaster most likely does not occur where students reside, how are travel, lodging, and food arranged for volunteers? The panelist responded that because schools of public health form these student groups, the students usually are not mobilized early on. Student teams might deploy to areas after an event to assist with community assessments etc. Before departure, lodging, food, and training are coordinated. Students are not sent into the disaster recovery area, and during the disaster, students are advised by the universities to go to safe areas.

Many participants described successful and beneficial experiences using student volunteers to collect, compile, and analyze data in partnership with state and local public health agencies. Students assisted in a variety of settings, including routine public health outbreak investigations in response to the pandemic (H1N1) 2009 outbreak. Chief concerns for using student volunteers were their safety and well-being during an actual response and determination of the best use of their skills given their academic, but not necessarily applied, experiences. Public Health agencies and student groups are not first-responders. How academia prepares students to meet workforce needs should continue to be evaluated. Collecting and analyzing data and providing findings to partners is essential to help decision makers understand that epidemiologic data are vital to a response.

Ongoing Occupational Safety and Health Challenges in Disaster Epidemiology

Speaker: Margaret Kitt (CDC)

ERHMS used in the Gulf oil spill came from the World Trade Center event. Two challenges after the Gulf response by NIOSH, were 1) when and how to conduct biomonitoring and communicate results and 2) how to determine whether long-term research studies are needed, the parameters of the research, and the research design. The national bioscience development workgroup is producing a

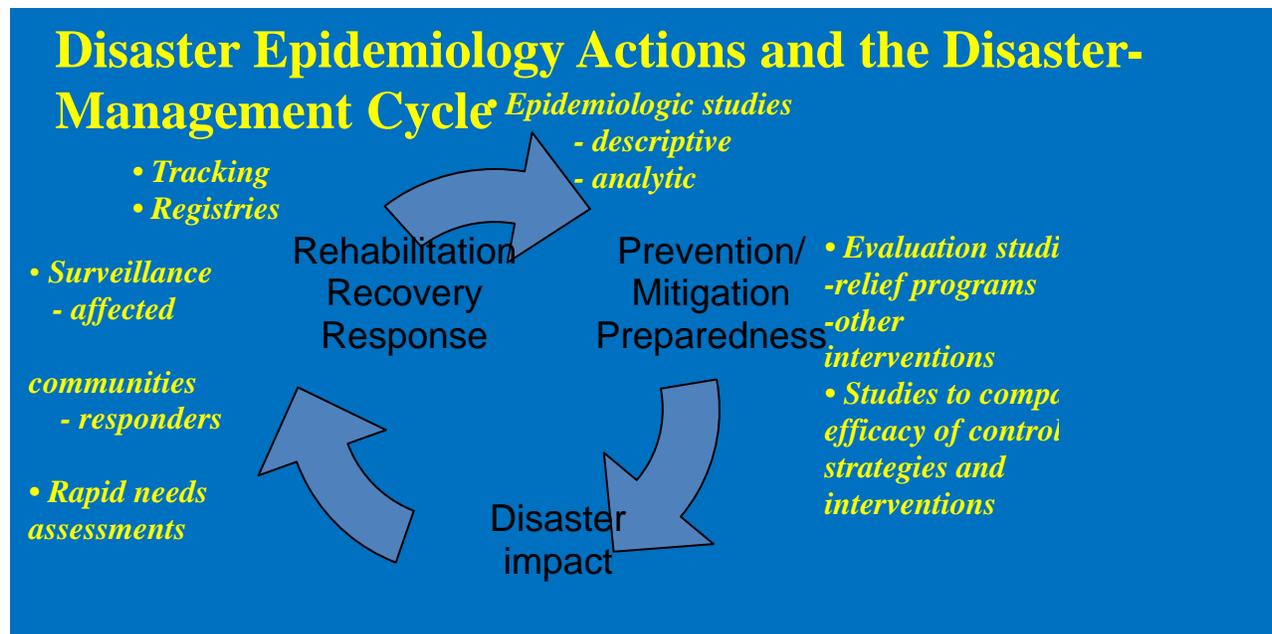
document on integrating scientific investigation into disaster response and balancing research and public health practice (report coming soon). IRB approval is not needed for situational awareness, but if IRB approval is needed, it becomes a complicated issue, particularly if multiple IRBs are involved.

Ultimately, the occupational health domain has multiple needs. These needs include training, obtaining state and local input, acquiring personal protection equipment for public health workers, improving communications with companies, and addressing legal issues and concerns if public health is collecting health data on responders.

Workshop Wrap-up Discussion

Speaker: Josephine Malilay (CDC)

The Disaster Epidemiology Subcommittee has been established for 2 years and has covered methods; institutional issues; community health; and specific disaster events such as the Deepwater Horizon and Fukushima events. CEFOs embedded in local and state health departments have played an important role. The calls for action from the first Disaster Epidemiology Workshop in 2010 were to document epidemiologic activities in the disaster-management cycle, build metrics for epidemiologic activities in the cycle, and implement full-scale application. The Disaster Epidemiology Subcommittee outlined actions that need to be taken at each phase of disaster (pre, during, and post).



The goals of this 2011 workshop were to

- 1) Share experiences from local, state, and federal perspectives.
- 2) Discuss a framework for epidemiology in disaster settings.
- 3) Examine lessons learned.

Many methodologies and accompanying issues were shared. These included using NIOSH's Emergency Responder Health Monitoring and Surveillance; using baseline assessments and identifying sources of information for the baseline; using syndromic surveillance and comparing information from it with death certificate data; exporting CDC's toolkits and forms for mortality and morbidity (available online); validating data, and identifying standards, perhaps an activity to be led by our academic partners. Workshops summarized uses and potential for CASPER, both for disaster response and routine public health community needs assessments. A variety of needs were identified: including mental health as part of the public health response; validating tools; understanding how technology can be useful;

knowing what questions need to be answered; addressing gaps in preparedness by using science-based guidelines; and setting up a repository for the wealth of forms and toolkits that exist. We also need to add injury, behavioral health, and lab people, as well as stakeholders to our workgroup.

Although we made great strides at this meeting, we still need to address issues: epidemiologic investigations (need for appropriate control groups, expansion of hypotheses, e.g., personal safety, to further explore such issues as sheltering in motor vehicles and safe havens, and importance of collecting data from multiple sources) and identification of solutions for institutional and legal barriers (provisions in local statutes, creation of reportable conditions, disconnect between public health and safety sectors within ICS, communication with the public for radiation and response and promotion of public health). So far, the lessons learned focus on “If we can measure it, it will be done.” Along these lines, what do we need to measure? What integration do we need from stakeholders for their input? How do we activate mechanisms for measuring what needs to be measured? How do we integrate results? Our plenary speaker detailed the landscape of preparedness and a focus on shorter, smaller events. We need to keep this landscape in mind as we develop methods and capabilities at state and local levels. We need to see where disaster epidemiology and strong science can be interjected and integrated in this landscape. For now, our questions are:

- 1) What skill sets would an epidemiologist need in disaster settings during all phases?
- 2) How should we redefine a capability to respond to mass events, including possible or planned disasters?
- 3) Should the term “disaster epidemiology” be changed to more accurately reflect our range of activities (even biosurveillance is unclear)?
- 4) How shall we implement full-scale application of disaster epidemiology, while engaging private sector and nongovernment organizations?